

Transcription of Oral History Interview
with
JOHN A. MOORE

July 23, 1998

Erickson: Professor Moore, would you talk, please, about your mother and father and where you were born?

Moore: I was born in Charles Town, West Virginia. People always made a point that Charles Town is two words, so as not to confuse it with Charleston, the capital of West Virginia on the twenty seventh of June, 1915.

Erickson: Well, happy birthday.

Moore: My father was a lawyer. My mother, of course, was just a wife. That was the thing people did in those days.

Erickson: Um hmm.

Moore: And I was the only *surviving* child from that marriage. I lived in Charles Town, I guess, for the first three years of my life. And then my mother took me and we went west to Nevada to Carson City, where I think ... (this was never discussed) ... it was the time that she divorced my father and married a person by the name of John Smith.

Then when I was four, we were in Nevada. The year I was five, we went to Oakland, *California* and we lived there for a year. Then when I was six, we moved to Markham, Virginia. It was so small, you couldn't even call it a village. They claimed, somebody claimed, 98 people in roughly one hundred square miles. It was the real "sticks." Now a road has been put through Markham, and people use it for a weekend home—people from Washington with lots of money, I guess.

Moore: So, that's where I grew up, went to elementary school and the first two years of high school. It was really a wonderful childhood, although by all measures we were just very poor people. But since everybody else was very poor, we never noticed any difference.

Erickson: Um hmm.

Moore: So, it was ... I had a dog. When I was very young, I was taught how to use guns and hunted, until once I realized ... after killing many animals ... that this one was a squirrel. I had killed it and I realized with horror I had killed this creature—and that was the end of my hunting days.

We are now in the late twenties when things were actually quite prosperous throughout the nation, but certainly not in northern Virginia where things were really depressed.

I went to school there, of course, and that was an interesting one. Certainly throughout the elementary school years and maybe what was equivalent to middle school. There was one teacher. I'm not sure she ever graduated from high school, and she taught all of the classes. I remember in the elementary years, the first grade would be in one row, the second *next*, the third and the fourth ... and she would spend a few minutes on this one, maybe ten, and then go on to the second grade, then the third and fourth. Well, in retrospect, I think that was a wonderful system of education, because you could always see what the students were doing, next year and the year after.

Erickson: Right.

Moore: And you could almost learn at your own rate, but I'm sure that would be highly disapproved of today. There weren't many students in each row, maybe three or four, maybe just two.

And then high school was in a nearby village called Hume, where the man in charge, Mr. DeZerga and his wife ran the school. Now he was the most educated person in the region, because he had gone to the University of Virginia. To be sure,

Moore: he flunked out the first semester, but still he had been to the University of Virginia. It really wasn't much of an early education.

I was interested in things having to do with science. I remember one very vivid event. There was a room in which there were some pieces of glass and an alcohol burner that had been inherited from some previous teacher, I suppose. Mr. DeZerga announced that it was possible to bend glass, you see, by heating it. Of course, we knew that that was ridiculous—you couldn't bend glass.

(laughter)

It would just shatter. Well, I began to think about this. Maybe Mr. DeZerga had seen glass bent. Now what could be wrong, because he tried to demonstrate this. He had this little alcohol burner, and he'd hold a piece of glass tubing in it and try to bend it. And nothing would happen. Hold it some more and nothing would happen. He then said he would give anyone in the class an A who could bend glass.

Well, I began to think about this. If he was that positive, maybe there was something to it. Could it be that there was something wrong with the alcohol in the lamp. Well, I now know it would be. It was old, it was probably evaporated. The alcohol concentration was so low, I remember, it would hardly support a flame.

So, I used to visit my father from time to time and on one of these occasions, I asked him if he could get me some alcohol, which he was able to do. We went to a drug store, and he got a little bottle of alcohol for me. Well, in triumph, I took this back and emptied the other alcohol out of the alcohol burner, kept it in a beaker or something, and put my alcohol in it, lit the thing, and there was a brilliant flame coming up.

Erickson: Oh.

Moore: And I bent glass! I thought Mr. DeZerga would be so pleased at this. He was mad. He said, "You cheated." Well, I guess that was the sort of encouragement one gets when the teachers aren't quite ...

Erickson: Oh, isn't that too bad.

Moore: Yes, it was. And then things started to fall apart economically. My mother and her second husband, *John Smith*, parted, and she took me to Washington. That would have been in my junior year in high school.

She tried to get a job without a great deal of success. She sold magazines subscriptions for a while. And then at the end of the year, she had a friend who had been extremely wealthy but had come on hard times also. But her friend had a friend at B. Altman's in New York. That's a big department store, very nice one there. And she thought maybe mother could get a job.

So, we went up to what would be my senior year in high school. Mother was able to get a job, and I had my last year of high school there.

To show you how well adapted we were to operate in a big city, you see, compared to Markham, I remember asking a policeman where there was a school, a high school. He told me it turned out to be a place called Harem High School over in Hell's Kitchen, the Hell's Kitchen area of New York. Well, this was really quite a place. It really was. At lunch time, we'd all be locked in the lunch room so there'd be no problems.

Erickson: Oh, my.

Moore: Most of us, I guess 80% of us had to stand up eating there were just so few chairs and tables, and you'd have to eat being careful trying to keep your elbows below your ears. It was almost like eating in a subway, and that was an experience.

Erickson: Goodness.

Moore: After that ... Well, my mother was always enormously encouraging. I really don't know what the extent of her education was, whether she finished high school or not. But she loved to read, and she would read anything, especially historical novels, but preferably biography and real history. She was a very well-read person and encouraged me enormously.

She used to tell me stories ... and this I realize in retrospect how enormously important mothers are. You see, she would tell me these stories, because we had essentially no books, let us say. And they were things that she had read before and it always involved something ... Alexander The Great doing thus and so, Napoleon doing thus and so, you know. In everyone of these, I was involved. Neither Alexander The Great nor Napoleon would have been able to accomplish anything without my very good assistance.

Erickson: That's cute.

(laughter)

Moore: It was just wonderful. Oh, I have to tell you a story about a library that Mrs. DeZerga—she was the wife of the high school teacher in *Hume*, Virginia. She thought we should have a library. Every school should have a library. So, we started putting on plays, and the parents would come and pay ten cents each or so, and after a couple of years she had an amount of money, let's just say \$50.00 (I doubt if it was that) for the library. She took that money and sent away to Sears and Roebuck and obtained the complete works of Zane Grey. That was our library. I don't know whether you're familiar with Zane Grey?

Erickson: Yes.

Moore: He's a western writer.

Erickson: Yes, I've not read him, but ...

Moore: Well, then coming back to New York. I graduated from high school there in '32, I guess, and went to Columbia. As I said, I was very, very poorly prepared for college at all.

Erickson: Well, and that was the Depression, too.

Moore: That was the Depression, and we had no money.

Erickson: Did you have a scholarship?

Moore: It seemed as though I could get a student loan for the first year, maybe. My father sent me a check of, I guess, ten dollars to pay for the entrance application. The check bounced
(laughter)

Erickson: Oh, dear.

Moore: but anyway. (pause) And this happens in everyone's life, how just sheer accidents make all the difference in the future.

As I said, I was very ill-prepared for the university work, especially at Columbia. But the person who interviewed me found out that I was interested in birds. Well, he was interested in birds. He was a member of the American Ornithologists' Union (that was the main one in the country) and so was I. I had even written an article that had been published in their journal, "The Auk," named after the bird. So that plus the fact that he had a map of the United States with pins showing where people came from—there was no pin anywhere near Markham, Virginia.

(laughter)

So, he went over very happily and stuck it in the map, and I got in. It was quite an experience.

Education at that time at Columbia was a remarkable thing. The core really was a liberal arts education, and that warped my life forever, for the better. They had this course, the main one, was Contemporary Civilization. It was a two-year course, and

Moore: that was an eye opener to me. It was mostly history from the Renaissance on, but there were all sorts of things: history, philosophy, everything that I didn't know at all. In fact, one of the exams I had to take to get into Columbia ... there were all sorts of questions. I remember I had never heard of things like Beethoven. I didn't know whether that was a fruit or a person or what.

Erickson: Sure.

Moore: I was just a very ignorant individual.

Erickson: Were you living at home then?

Moore: Yes, my mother had an apartment. I lived there the first year, but then she had to rent out the room I had to make ends meet. I was able to get a room at Columbia for my sophomore year. And I got a meal job, so that solved things.

Erickson: I see. What I was wondering is if you could share some of that information with your mother? You had said how much she liked to read, and when you were going to Columbia and learning all these things, I wondered if you shared?

Moore: I don't remember. Jan, this is a long time ago.

Erickson: Sure.

Moore: A long time ago. We are talking about the mid '30s. You know, your raising that question ... I have been thinking about this recently. Maybe when people get old, they sort of wonder, "Why didn't I ask my parents that?" But the sorts of things that I would like to know about them, their hopes, their aspirations and all these things just never occurred to me to ask. I've asked other people about this, and it turns out that most of us really know very little about our parents.

Erickson: True.

Moore: I mean, they were exalted people, and if they told you something, fine. But I wouldn't have thought of saying, "Well, why didn't you stay married to my father?" ... something like that. That never would have occurred to me. And, "Why did you marry John Smith?" He seemed like an awful person—well, he was. In many ways he was an awful person, and awful to her in many ways. But you didn't ask your parents that.

But very early on at Columbia, I decided that I was very much interested in biology. I had worked on the birds of West Virginia, of course. I thought I was going to monograph the birds of West Virginia.

The first class at Columbia that I took, the first lecture was in Zoology I. I had looked in the catalog, and I had seen that you are supposed to have a year of chemistry before you take any biology, but I didn't understand what possible use chemistry was if you wanted to study birds. So, I registered for the course and nobody caught this.

I went in and the professor, Donald E. Lansfield—he is one of Thomas Hunt Morgan's students, a very distinguished geneticist. He said, "Well, it goes without saying, there should be no freshmen in here." And I stupidly put up my hand and "I am a freshman." "Well," he said, "You don't belong here." And I said, "But I had biology in high school." "Well," he said, "by all means, take a year off and forget it."

(laughter)

But that's sort of the attitude most university people have about anything that has come before it. It isn't quite kosher. But anyway, I talked him out of it. I went up and explained to him that I was probably the world's authority on the birds of West Virginia. I think he was so appalled at this, he let me stay.

Erickson: He did?

Moore: Well, most of it was so over my head I got very little out of it.

Erickson: But he let you stay.

Moore: I was able to pass the course. The first year had a bunch of chemistry, and I didn't know an atom from a molecule or any of these esoteric things. The second semester was on the vertebrates, and it was mostly dissection, and it was about organ systems, and I just ate that up.

So, I redeemed myself, and I got to be friends with some of the graduate students and some of the professors. In retrospect, it was very hard for me to understand how people then and always have been so nice to me. I don't understand it, but I appreciate it. So I did my undergraduate work at Columbia and my graduate work too.

The Graduate Department of Zoology there at Columbia was then the outstanding one, possibly in the world. It had been rated by these things (*evaluations*) that universities do since the middle 1890s, and it had always been No. 1 in the nation.

In a sense, modern biology began there. There were two outstanding scholars: one was E. B. Wilson, he was a cytologist; and the other was Thomas Hunt Morgan, the geneticist. Right there in the rooms where we had our labs, there had been the so-called "fly room" where Morgan and his students were. By the time I was there, they had moved to Cal Tech. And that's where it all had begun, where the genetics of *Drosophila* was worked on, genes on chromosomes, linkage of genes, effects of these—all of these things were worked on in enormous detail. And people came from all over the world to study with Morgan and Wilson. But that combination of cell biology and genetics, which is the basis of modern biology—it all started there. It was fascinating and very exciting.

But the attitude there in the department was almost a sink or swim for the students. You were supposed to demonstrate that you could be a scientist. And one got very little help of any sort, except if you needed a piece of equipment. Well, there wasn't much equipment anyway that you had, but if you needed some chemicals or something like that, the professor would

Moore: help you get them and would discuss from time to time what you were doing. But it was a very loose sort of arrangement.

To give you an idea of how loose it could be, the wife of that person who became a professor there later, Sally Schrader, a person we admire greatly and for whom we had named our daughter, was working under E. B. Wilson, the world famous cytologist, an extraordinarily kind, gentle man.

Sally had begun this problem under his direction, but he just said, "Well, why don't you work on the cytology of the formation of sperm?" That's what cytologists did in those days, they worked on the change that we call meiosis in the formation of eggs and sperm. And she had done this on some particular insect, written it all up, and had made all the drawings. To write it all up, she had to borrow a typewriter, of course, and do it herself.

She took great pride and came in to Professor Wilson with this manuscript and the drawings and said, "Professor Wilson, here is my dissertation. It's completed." Wilson replied, "Sally, I thought you were Morgan's student."

Erickson: Oh, goodness. That's so discouraging.

Moore: That was sort of the level of it. The husband of Sally Franz Schrader, had this relation with another of his students. This was a person who wanted to work on a problem of cytology, and Schrader suggested one on the chromosomes of pediculopsis. Some either Swede or Norwegian, somebody from Scandinavia, had described what he thought was going on, and Schrader thought this was all poppycock and couldn't be.

So, he wanted *the student* to do the work over on the cytology of this mite, a tiny little creature and see if the original description had been correct. So, he gave this student a long paper to read.

The student actually had to learn German to read it, but he did and came back and then said yes, he would like to work on that

Moore: problem. The student said, “Well, Professor Schrader, where do I get the material? Where do I get pediculopsis?” “Why, that’s your problem,” Schrader answered.

(chuckle) For all he knew, it was in Scandinavia. This was a very talented person and he found it. He lived out on Long Island. He found it in a vacant lot not so far from him, but that’s the flavor of the time.

The people who were our teachers, at least the dominant ones, had been students of Morgan and Wilson in the teens. And at that time, you were expected to know all branches of biology at a graduate school level—all.

Well, by the time we were going through in the 1930s, that was no longer possible, but the professors didn’t realize that, and we were tested on all fields of modern biology.

And it was quite a work out, it really was, but a very valuable one because I think every student getting a Ph.D. from Columbia in those days, we were enormously broadly educated. We just knew the field. And we’d go to Woods Hole (on Cape Cod in Massachusetts) and other laboratories and we’d meet other people, and we were appalled that they knew one thing very well, but the rest was just a mystery to them.

I got my Ph.D. after three years.

Erickson: That’s remarkable.

Moore: The reason I did ... one of the professors there, Arthur Pollister a very wonderful friend, came in one day and said there is an opening announced at Brooklyn College—well, it wasn’t announced.

Things weren’t announced in those days except by word of mouth. You know, you’d call up friends and say, “We have an opening, and do you have anybody to suggest?”

Moore: An opening at Brooklyn College, and Professor Pollister said, “I think you should apply, because I haven’t heard of an opening for several years now anywhere.”

At that time I had a great deal of trouble really wondering if I could be a professor. I mean, of course, I didn’t start out being a professor. I had a very bad speech impediment. I stammered terribly.

I was one of these people who originally had been left handed, and by the time I went to school, I was made to switch over. Later people thought that could get your brain so mixed up that probably was the cause of stammering. I don’t know whether that hypothesis is still valid or not, but anyway the correlation was there. But I was able to manage.

Well, they gave me the job, and that was an interesting one in many ways, because the teaching loads were impressive. The normal one in the daytime was sixteen hours a week, contact hours. But I was hired primarily to give a graduate course in the evening—four hours on each of two nights ...

Erickson: Oh, my.

Moore: from seven to eleven p.m.. At that time, I was living in Manhattan and that was more than an hour’s ride on the subway. It was quite a workout having twenty-four contact hours a week.

Erickson: My goodness.

Moore: But also, the philosophy of the chair of the department was quite a broadening one. He wanted all the young people coming in to rotate through all the courses, all the undergraduate courses. That was quite a workout, too.

I think the strangest thing I ever taught (but that was later) was Cryptogamic Botany. For a Zoologist, it’s sort of interesting.

Erickson: What does that mean?

Moore: Well, those are the lower things, the mosses, the liverworts and things like that. Crypto hidden, all the gametes were hidden. The plants were ... Oh, I won't say that part on the tape.

My salary then was \$1200 a year. It was hard getting by on that even though things weren't quite so (*expensive*) ...

Erickson: Now what period would this have been?

Moore: Well, that would have been from '39 to '41. I was there for two years, and I was able to do a good deal of research, including some that I was doing at Columbia. So, I would have to go from home, go lecture, then there would be a few hours, and I would come back and do something in the lab, then I would go back again.

Erickson: Gosh.

Moore: I got to know the subways very well. But then after two years there, I was offered a job as an assistant professor at Queen's College, another one of the municipal colleges. I was there for two years, and the teaching loads were not as heavy. I taught their Invertebrate Zoology, I taught Botany, I taught introductory work and a course in Physiology, all sorts of things.

And then in '43, I heard of an opening at Barnard, rather I was asked to apply for it. That's the women's division of Columbia University. I went there and was there for a quarter of a century until I came here (University of California at Riverside). And that was really a wonderful experience, although again I had a heavy teaching load. I did the whole year by myself of the introductory course, Zoology I and II. That became the largest non-required course in the college.

I enjoyed those students so much. Most of them were liberal arts students, and I made the course a liberal arts course to the extent that the biology students were not quite happy about it. They weren't learning enough names of bones and things like

Moore: that, they thought, to pass the MCATs to get into medical school. But they were just exceptional students, and I enjoyed them enormously.

I gave a number of different courses, in addition to this big course, which the lectures were Monday, Wednesday and Friday mornings, the labs were Tuesday and Thursday mornings and every afternoon.

Erickson: Goodness.

Moore: So, something was going on all the time. But then I usually had two one semester courses that I would give in the fall and spring.

Erickson: And you did that for more than twenty years, you said.

Moore: Twenty five, a quarter of a century. I came here in '69, I guess. I noticed one of your questions, "Why did I happen to come here?" or something like that. Well, you know, it's often hard to answer questions like that, but I know the answer.

(chuckle)

Erickson: Well good.

Moore: A number of things happened. One thing at Columbia, the university that had had this wonderful very broadly-based department, decided that it wanted to specialize in the new stuff, molecular biology only. It was going in that direction, and that was so against what I thought it should do.

At that time I was also working (we can cover these things later) on something called the Biological Sciences Curriculum Study. It was one of the curriculum reform groups, you know, the chemists, the physicists, the biologists. After Sputnik went up, the people inside the Beltway became hysterical, and all of this money became available to improve the education of high school students. I guess high school students were to get an

Moore: American satellite into orbit, or whatever. That was the area that we worked in.

Well, I was working on one of the versions of that in Seattle. This must have been ... oh, late '60s. I came home ... my wife had been there with me, but she was working on a project and she had to fly home. I had our car, and I drove home—came down the west coast, came to Riverside because Rudy Ruibal was here.

Erickson: Um hmm.

Moore: And Tim Prout. They were both students I knew from Columbia. Then I went across the southwest, and I have never been so overwhelmed by anything as with this whole trip. I had never come down the west coast, never been in California, except for Oakland when I was just an infant. I went across the southwest and thought, you know, things are getting grubby in New York. For all the things that were ... the town was going to pot.

All of our friends had been mugged coming to visit us, because where we lived was an apartment just to the north of the university, and that was in Harlem. It was a tough area. That was another reason. And then I began to think why do we want to stay in New York? The town's going to pot, the university (so far as I could see it) was going to pot, and I think if I ever get an offer any place in the southwest, in California, in Arizona, in Utah, in New Mexico and so on, I will certainly look into it very seriously.

Up until that time I had many offers from many major universities, and I thought, "This is ridiculous. I am where it is. There is no reason to go somewhere else."

And then I began to think about it, and very shortly after that—because I had told Rudy Ruibal that I was just so impressed with this trip and this whole area that I was thinking about moving to the southwest.

Moore: Well, he started to tell me about UCR, and I found that something very close to my heart, because at that time it was the Swarthmore of the West, or something like that with a very great emphasis on the thing I have been striving for all my life—to make the sciences courses into liberal arts.

That's the one thing that has actually driven me almost pathologically to do. And then I got an offer and came here. Well, I have regretted it in the sense that very shortly after I got here word came from Berkeley that the campus could grow from being about 12 or 14 to 20,000. I thought what have I done!

And it became a general campus, and education really took a back seat. It (*research*) became the thing to do ... originally it was research and your scholarship, but it (*later*) became to get a grant. The coin of the realm became the size of your research grant, because, you know, there's overhead and all sorts of goodies coming with that.

Erickson: Sure.

Moore: And that I thought was so bankrupt that I sort of lost heart, but I have never regretted coming here at all.

Erickson: Good. Well, you were married by then. You and Betty had married by then.

Moore: We were married when I was still a graduate student. We were married in '38, and our daughter Sally was born in 1941. We had another daughter born a few years later, but she died in infancy, which is, of course, a very discouraging thing.

But in addition to this, I have also ... maybe within the last month, I have decided maybe I really am not a researcher in the sense of doing lab work, although I always have and loved it, but there are so many other things—and it is a zero sum game. Let me just tell you about this.

Erickson: Um hmm.

Moore: I guess it was in 1959. Sputnik, I think, had gone up the year before or something like that. But I had a very serious illness that resulted in my arms being paralyzed and so on.

Now the sort of laboratory work that I had been doing was transferring nuclei from one cell to another, the sort of thing done with Dolly. You probably read also about all these mice that have just been cloned. I was using frogs. This was experimenting with frogs in the '50s. And I was doing a lot of work and just having a wonderful time with that. But that involves, you know, very careful moving of pipettes, and it took my arms a long time to get back so I could do that.

Erickson: Sure.

Moore: And at that time the Biological Sciences Curriculum Study started. That was to study how to have better high school biology. I was made the Chairman of the Committee on the Content of the Curriculum. We used to meet very often, at least once a month somewhere in the nation, and it was a very active thing. We decided to produce these books. We decided we would have three different versions so we couldn't be accused of, "Oh, you are trying to develop a national curriculum," and other sinful things like that, so we were going to have three.

I did the so-called "Yellow Version" ("*Biological Sciences An Inquiry Into Life*")—that was a general approach emphasis. I used to tell my colleagues that was the "intellectual approach." (laughter) The others were in general physiology and in ecology, that was the emphasis. But all covered the field.

Well, that became a tremendous job. We met the summer of 1960 in Boulder to write the experimental set of books, for each of these versions. Now for each of these versions ... Well, I'll just talk about mine, the Yellow Version. We had a book for students and a book for the teacher (how to do it), and a laboratory book for the students. Well, we had to turn those out. We wrote in the summer, and they had to be available by September, you see, for use in the classroom. Well, of course,

Moore: we didn't get the whole thing done then. We did the material for the first semester and then wrote the material for the second semester later. This was something that occupied just about all of my time, apart from teaching.

Erickson: Oh, I am sure.

Moore: It was a very, very heavy workload. And then in the summer of '61, we revised and then in the summer of '62, we started working on the first commercial editions. Well, for about ten years, that was a major effort.

Erickson: The group in Colorado was the experimental group?

Moore: Well, we all met out there to do the experimental books of the three versions. So that was the headquarters, in Boulder, Colorado.

Erickson: Who were the writers who worked on this?

Moore: Well, the people who came to work on it were other biologists and high school teachers, high school administrators. But most of the writing was done by university folks. Every team had ten to twelve people on it. Most of the actual work was done by maybe two or three. That doesn't mean the others were not extraordinarily valuable. The high school teachers especially. They couldn't write very well and their knowledge of biology wasn't all that great, but they were wonderful critics. "Are you out of your mind discussing that topic at this level?"

(laughter)

And they were essential for the success of these things. In those days, the books were enormously successful. Harcourt Brace and World in those days (Harcourt Brace and Jovanovich now) published my Yellow Version, and they gave me one copy stamped "one millionth copy." *Later the two millionth copy.*

Erickson: Oh, my. One million?

Moore: One, two million copies. And it was translated into many different languages. I have copies of the Yellow Version in languages that I don't even know what they are, but it was translated into about six.

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Beginning of Side B

Moore: Well, we knew about this, but there wasn't much we could do about it. We knew that the key here was really not what we wrote, but what we wrote in combination with an outstanding knowledgeable teacher.

Erickson: Teacher, um hmm.

Moore: And probably the teacher was the more important. Because a good teacher can teach a good course no matter what the book is, but a poor teacher can't teach a good course, no matter what the book is either. So, that seems to be it. The NSF was supporting this, and we thought we had arrangements with the NSF that after the commercial editions came out, we could use the royalties (which were enormous) to give refresher courses for teachers, to give summer courses for teachers, and to do all sorts of things.

But the NSF was unaware of the law, and so we were too. It turned out that all of those royalties went back to the Treasury of the United States, not to the NSF, not to us. So, we tried to get other funds from NSF, but then we were told that we were not to play any role in educating teachers. That came from the NSF.

Erickson: Hmm.

Moore: Yes, you look puzzled. You should look puzzled. But just think about it. There were three versions: Harcourt had one, Rand McNally had another and D.C. Heath, I guess, had the third. All those other publishers out there—“This is unAmerican. This isn’t fair. Those three publishers have what is a national curriculum, and here we will be penniless.” And so on.

So, they raised a big rumpus up on the hill (Capitol), and pretty soon the word came back to NSF, you know, “cool it.” There was no money for teacher education. We really goofed. That effort proved, although it had an impact, the books were widely copied elsewhere. It had more of an effect overseas. It really changed the teaching of biology throughout the world more than here, because we very quickly reverted to sort of a pabulum that is easy for the teachers to handle.

Erickson: All that work.

Moore: Yes, but that’s one thing that took a lot of time, and of course, that was away from research. But as I said, that was a period when I couldn’t do much research because my hands didn’t work very well.

But then just about the time the first edition of “Yellow” was coming out, I became the Chairman of the Sixteenth International Congress of Zoology (1963), which was held in Washington, and I was the program chairman. That was an enormous job, too, of getting the people to come, all of the abstracts. And I had to oversee sixteen publications coming out from that (of which I wrote about three).

Then later on I worked on a middle school *science* program, again an experimental one. The year I retired I began Science As a Way of Knowing, which was background material for teachers at the college and university level. And I am still working on that now.

And then I do things ... I mentioned the library studies I did before. And I’ve served on lots of committees. Of course, I

Moore: didn't have to do that, but I thought it was important that I serve on any number of education committees. Now most of these committees it makes no difference whether we exist or don't exist. But still I am always hopeful. Maybe we can make a difference.

Erickson: Oh, and you can—you have!

Moore: Well, not any more in the sense that the reaction of scientists in the 1960s was so different from now. I mean, we really got together. This is true of physics, chemistry and biology—we produced books and programs for all of these sciences. And now it's mostly committees and getting together and concluding that American students really do not know very much in science and mathematics. The international studies indicate that is so. And we just talk about it and wring our hands and know we really should be doing something, but nothing happens. It drives me up the wall.

Erickson: Um hmm.

Moore: My daughter keeps telling me, "Father, stop it. Do these other things that you can do." Of course, she's right. The only things I've really accomplished in life are those that I've had essentially total control over. It makes a difference.

Erickson: Sure it would. Is your daughter a scientist, too?

Moore: No, she is in the humanities. Oh, she now lives here in LaJolla. Her husband is the Research Director of the Neurosciences Institute there at Scripps. She does the book, Librettos, for children's operas. She used to write poetry, but now she's gotten into this. She's had three or four CDs, which in that field to break into it, it's quite an accomplishment. So, she's very happy and enjoying life enormously.

Erickson: Great. Now Betty is a scientist.

Moore: She's a scientist, but she doesn't get into the lab any more. Had a bad fall four or five years ago, and that was the end of the laboratory work.

Erickson: Oh, I didn't realize that.

Moore: She had taken the dog out, and he pulled her over, and her hip and ribs were broken and an arm was broken.

Erickson: I do remember that, but I didn't realize that she wasn't doing her research any longer.

Moore: No, she doesn't come and do any. Well, I don't do any research either. I just write a tremendous amount of stuff. I'm working on a book of evolution and creationism to try to present a balanced view of those contentious fields, of that contentious altercation.

Erickson: Um ... How will you do that, John? Will you take the science point of view?

Moore: No, no. What I have done in the first chapter is the evidential basis for creationism, then the evidential basis for evolution, pointing out that these are two patterns of thought, one based on belief and the other based on confirmable evidence.

Now one can believe whatever he wishes. But there are consequences of what thought pattern you use, depending upon what you are thinking about. Now most of us, most of the time, do not use rational thought to decide, you know, what sort of shirt I'm going to wear today, or things of that sort, or what sort of a necktie I'll have on, or where to go to the movies or anything like that.

But if you want to advance medicine, if you want to advance the treatment of diseases, things of that sort, it's generally been found that you don't slaughter a calf and burn it on an altar. That's not necessarily the way of curing the problem. And then it's an interesting thing I'm trying to do. Whether I can pull it off remains to be seen.

Erickson: You mentioned cloning earlier. What's your feeling about cloning and the ethics of it?

Moore: That's something that is inevitable. There are all sorts of things that human beings can use information for that is good or bad.

Erickson: Um hmm.

Moore: I think it's unlikely it will ever become widespread ...

Erickson: Oh, you do?

Moore: for the simple reason ... You see, we already know from animal breeding and things of that sort that if you select horses or cows or chickens or whatever, you can generally get desired characteristics. Well, you can certainly do that with human beings also. But that raises a horror in so many minds, I don't think there's the slightest chance that would happen.

There's even a great reluctance to say that an individual who carries a known very serious genetic basis (*gene*) for a horrible disease to say they can't have any children. Because the chances are maybe some of the children will be all right, others won't. But you could at least stop some misery if people having a few of these genes that can be detected were just talked out of having children of their own. Maybe they could adopt some if they really wanted children. But you see, we don't do that.

Erickson: Um hmm.

Moore: Now, that's a relatively simple thing compared to what cloning could be. And people sort of imagine, I think, this completely far-fetched ... "Well, suppose Hitler was able to use these techniques to develop a superior Arian race or something like that." Suppose we clone Hitler. My gosh.

Moore: So, I don't worry about it. All sorts of things were vigorously opposed. Small pox inoculations—that was fought and fought and fought.

Erickson: Was it?

Moore: And fluoride in drinking water. “Why, that's rat poison.” Well, it is rat poison. It just depends upon how much you use. So, I don't think that knowledge per se is bad. It's how we use it. It may be highly beneficial, it may be disastrous, as in wars.

Erickson: Right.

Moore: We know so many good ways of doing things. It's kind of too bad we resort to points of view like the Talibans in Afghanistan right now, their behavior towards their women. It's horrible, horrible ...

Erickson: Um hmm.

Moore: but that's their religion.

Erickson: In your academic life, John, what would you say have been the most rewarding and the least rewarding aspects?

Moore: Well, the least rewarding ... that's sort of tough. In fact, that's very tough. But the rewarding ones, I think ... well, when I was actually doing laboratory research, I used to enjoy that enormously, all aspects of it.

And certainly teaching. I find it so compelling to try to take very complex ideas and simplify them so a general arts student in a beginning course can understand them. That's something that I've always liked very, very much. And I like to try to pull things together. I like to try to synthesize fields in writing as well as in lectures. That gives me a lot of pleasure.

I guess there aren't any major things that I have found a problem with. Minor ones ... I used to dislike very much writing letters of recommendation for medical school or

Moore: whatever for students that I didn't know very well. Those that I knew well, you know, I liked to do that, but certainly not most of the people, you just don't know.

I don't like to read proposals that come from NSF on other people's work and pass on them.

I despise having to evaluate my colleagues when it comes up for promotion, although I know full well that has to be done as honestly as you can no matter how distasteful. The university is more important than its parts. Those are relatively minor things.

My general feeling is I am amazed, and appalled really, that society is willing to support me well in things that I love to do.

(laughter)

Erickson: Isn't that great.

Moore: Yes, it is. I just hope that doesn't become generally known.

Erickson: No, we won't tell anybody. Would you talk about the museum that you are trying to create?

Moore: The California Museum of Agriculture. Well, I have forgotten how I got interested in this, but what I had hoped to do was over the years for this campus to start and to develop what would be a world-class museum in agriculture.

And it was going to be quite different from the usual agricultural thing you see in museums: "This a plow, this is a hoe, this is ..." but to deal with it from the point of view of problems, of how crops are raised.

The beauty of having it here is that you can raise so many crops in this climate. And it was eventually going to be a huge thing with material on the crop that would be, obviously an outreach thing for the school children to come and raise crops themselves and to learn about them and to have it be an

Moore: intellectually rigorous ...that this is a fun thing looking at a plow

But that came at a time when Chancellor Rosemary Schraer was, I think, having a very difficult time with the California Museum of Photography and overruns in renovating the building or whatever it was. When this came to her—"Not another museum!" So it was deep sixed.

Erickson: Well, maybe later.

Moore: Not by me.

Erickson: Not by you. That's too bad.

Moore: That was in the tradition, of course, of this campus and ...

Erickson: Sure, with our ag background.

Moore: There were some real giants here, some real giants in the field of agriculture. And I don't regard agriculture as exactly a dirty word at all.

(laughter)

It can be a highly intellectual, highly stimulated and extraordinarily important thing that human beings do.

Erickson: You talked a little bit earlier about your involvement with science libraries, and UCR is about to open their new science library.

Moore: I have not been through it. People who have say it's a simply gorgeous thing. The whole arrangement is really almost lavish, it's so attractive and so well done. There's going to be room for all the books and room for all of the readers, even though most students now who are in libraries aren't using the library books. They are reading their own notes. It's a very expensive of running a study hall. Be that as it may, it's nice surroundings.

Moore: But as to what it's going to do to improve things, I don't think very much for the following reason. After having studied all of these, well about half the libraries in the university system when I was working on this, this library is just a jewel. I mean, they don't have to do anything but get more space for their books in order to be extraordinarily outstanding. People come from places like Yale and so on, people like Jeff Powell being one, and say that this is the best biology library they have ever seen.

Erickson: Oh, that's wonderful.

Moore: So, I don't think this is going to make a major difference. There has been no systemic problem with our libraries. And that goes for the general library, too.

Right now, any extra time I have I bootleg, because I am interested in the history of illumination from earliest times in Stone Age on up to the end of the age of kerosene. And, I am incredulous at the number of things that I have to read are right there in Rivera now.

How did it happen that this strange thing ended up in Riverside? We just have, you know, some very capable people, especially in the early days when they had more money. Acquisitions was something taken very seriously by librarians and by the early faculty here—and they did a magnificent job, of which I am reaping some of the benefits.

Erickson: Ivan Hinderaker was the Chancellor when you came in '69, right?

Moore: Yes.

Erickson: And then you worked for various deans through the years then?

Moore: No, not really.

Erickson: No.

Moore: Because the things I am interested in is education at UCR. And that is not something that is of high priority for any office of administration I have known. They give lip service to it. I mean they have to say the right things, and they do, but it's not compelling. It's so hard to make ends meet, to keep their budgets straight. And it's much more spectacular to have a new building or something like that than to have a truly integrative new approach to general education.

So, I like every dean I have ever know. I don't know to what extent they liked me, but in any event ... we are just interested in different things. Deans now ... poor Mike Clegg ... he's just trying to hold the place together. He can't think about these artsy-crafty things of how best to teach science for non science majors. In fact, that is never high on the agenda of people in the sciences either.

In the last issue of Science or the one before there's an article by Bardeen and Leon Letterman. Letterman is a Nobel Laureate in Physics. There is a commentary on the article and the commentary on when they are talking about the quality of teachers. Well, everybody agrees now that they're just terrible.

There are some absolutely wonderful teachers, but on the whole, most teachers in the sciences have neither a minor or a major in the field they are teaching—sometimes not even a course in that. I am talking on a nationwide basis, not just California.

But a man from Texas was commenting on the examinations that were given to test whether a student can become a teacher or not. "Well," this man drawled, "the most useful test I have ever seen is that if they can achieve 97° Fahrenheit or above, they are in."

(laughter)

Moore: If they're warm, they're hired. And that's going to become increasingly so. Well over half the science teachers are going to be retiring ...

Erickson: Oh, my.

Moore: in the next decade, well over half. Dr. Lane, who for a while was head of the NSF, was talking to us about this problem. He said, "You all complain about the quality of the teachers and so on. But just remember, people are going to be hired to fill these posts."

And one thing that is really so important. You see, the key to educational reform in the K-12 years is really not for the colleges to bash the K-12 educational system but to vastly improve the quality and the education of the students that we have who aspire to an education in K-12 education. And if we bash them, I mean, after all, who educated them? Well, we did, but they didn't get the point, or something. We are at the crux of it, and that seems to be a nut that's very, very difficult to crack.

The campus right now is trying to get a large grant from NSF, so we are really going to get serious about the education of the teachers to be. From what I gather, there is a great deal of interest in getting the grant, but the problem is to convince the faculty members that this is something we simply have to do. There is a national crisis and the quality of our K-12 educational system, and we have the ability to do something about it.

Another quote from this article I just mentioned, is there is some talk of having courses in physics for freshmen, and then they go on to chemistry and biology. Most students are so turned off by science by the time they get here ... But then the people, one of them is quoted, the person in physics, saying, "Well, we don't do freshmen." There is that level of elitism that doesn't help one bit.

Moore: Colleges and universities, the ones that really set the pace for higher education, have simply not been willing to accept that they have a tremendous responsibility which they are largely avoiding. (pause) You see, when I talk like that, deans don't like to hear it.

(laughter)

Erickson: Well, we hope they are listening. When were you named to the National Academy of Sciences?

Moore: 1963.

Erickson: That was back in New York. What do you think it was in your research that prompted that award?

Moore: Well, I had done a lot of this cloning of frogs. That was the work I had done. I had done a lot of work on the experimentation with frogs, not only in the area of development—cloning and things like that—but also the general ecology, natural history and so on. And that was also just after ... no, that was year of the Congress, and the National Academy of Sciences was running the Zoological Congress, and I think they were pleased with the way I had run it so ...

Erickson: How did they notify you of that?

Moore: Illegally.

Erickson: (laughter) Do you want to tell us?

Moore: A person who I think was mainly responsible for my getting, I mean initiating this, was Bentley Glass, the biologist. He was the first Chairman of the Biological Sciences Curriculum Study, a distinguished biologist, very much interested in general matters, became concerned in Pugwash and all those. He called me up the morning before the elections and asked Betty and me to come down for dinner because I was going to be elected to the National Academy. No, he didn't put it quite that way,

Moore: because I thought it was all over. It wasn't over at all—they hadn't even voted, but he was so sure.

Erickson: He just knew! (chuckle) So you were there?

Moore: Yes, I went down. I mean for dinner. I didn't go to the meeting, of course. That was over, but Betty and I got there for dinner and that was nice, of course.

Erickson: They hold annual meetings, or more often?

Moore: Well, there is the annual meeting, which is every April. But now they have regional meetings. For example, we have one early in the spring at the Beckman Center, and there's another one ... well they are around the country in four or five places where they have these regional meetings.

Erickson: What do you think ... um ... that having a National Academy of Sciences person on a campus can do for that institution?

Moore: Do for the institution?

Erickson: Uh huh?

Moore: Oh, not much really. The publicity people like to mention it from time to time. But I don't think in recent years I have seen any note that we have this distinguished person, you see, namely me, here. Thank goodness there has been none of it. So, that makes a little difference.

Erickson: I thought you might say that it helped in recruiting other National Academy people to the campus.

Moore: Nah. I wouldn't think so.

Erickson: Have you ever been involved in helping recruit?

Moore: Oh, yes, yes. But I have never been on a committee in which we are looking for other than the cheapest person we can get.

Erickson: Oh, dear. That's what it comes down to.

(laughter)

Moore: What we get are the assistant professors, and they could care less to whether a person is a member of the National Academy or not. They probably think I am too old to be useful in any way.

Erickson: Oh, I don't think so. We do have ... isn't it about five on campus now?

Moore: Well, no. There is Noel Keen, Mike Clegg, George Zentmyer and me.

Erickson: And Austin Riesen.

Moore: Well, he's dead.

Erickson: Right.

Moore: And long ago, there was one in chemistry, too.

Erickson: Oh, was there?

Moore: Yeh, before I got here. Maybe Conway Pierce? I don't know who it was.

Erickson: Could be. I don't know. Well, when did you retire, John?

Moore: When did I retire? Well, when you folks stopped paying me.

Erickson: That's ... I want you to tell that cute story.

Moore: That was ... let's see.

Erickson: Was that in the 80s?

Moore: Yeh. (pause) Well, let's see. I had to retire when I was 67, and I was 67 at the very end of June. I could have stayed on one more year if I hadn't been. That would be 1982, wouldn't it?

Erickson: So, it was mandatory that you had to retire then? But they've changed that now haven't they?

Moore: Oh now you can be immortal. Yes.

Erickson: Forever.

Moore: That's terrible.

Erickson: Oh, terrible?

Moore: Yes.

Erickson: Oh, I thought you might think that was good.

Moore: Well, I suppose there are isolated cases, but I think the arrangement they have of letting people retire or making them retire which you can't do now, because some old blowhard in the Senate years ago was about 150, you remember, he got the law changed so you couldn't.

(laughter)

Moore: Maybe he was 200, I don't know, he was an old person. But you have to let people retire and the young people have to come in. They need jobs. I have been as productive since I retired, except for teaching. I have published far more stuff because I have the time to do it.

Erickson: What's that cute statement that you gave the other day?

Moore: Cute?

Erickson: About volunteer service.

Moore: Cute? That's a horror story. I don't understand quite how you think about those things. I have now worked for UCR, and I come in every day ...

Erickson: Every day, I know you do.

Moore: except I used to come Saturday and Sunday, but I don't do that any more ... for more years than I was paid.

Erickson: That's what it was. That's a horror story?

(laughter)

Moore: Of course it is.

Erickson: But you do still have your same office?

Moore: No, I have moved several times, but I have a perfectly adequate office.

Erickson: And so you don't have a laboratory because you are just doing writing?

Moore: Yes. There isn't any lab work I want to do any more.

Erickson: Do you use the computer for your writing?

Moore: Oh, yes, the word processor. But I use only two fingers. I never learned to type.

Erickson: Well, that's the journalist.

Moore: Is it?

Erickson: I think so. Where did you travel on your sabbaticals?

Moore: Well, I only had one really, and that to Australia. I spent a year in Australia. I had a Fulbright then. That was the early '50s, I guess. That was just at the end of one of these actual traumas that changes one's life.

Moore: The old Zoology Department at Columbia was outstanding and all that, but it consisted of a bevy of birds of paradise that could hardly stand each other. And at that time, my appointment was at Barnard College. I wasn't even a member of the Graduate Department, although I gave graduate courses. And I was made the Chairman of that department at the age of about 33. For three years, that was a very, very heavy and very difficult and unpleasant job.

Erickson: Was it?

Moore: Oh, yes. I mean, keeping all these birds of paradise happy. But that stunted my growth. It was all these things like that. It was the Zoological Congress and all these other things that really took a lot away from effort that would otherwise have been research.

Erickson: What are the areas of the university that interest you, in retirement?

Moore: Well, certainly my colleagues in the department and the wonderful library and the staff people that I know. In a sense, it's so different from some of the other places I've been where people just aren't happy together. That makes all the difference in the world for people when they do get along.

This is certainly not true of all the departments. There are some real tragedies on this campus, but I think ours by and large is a happy department.

Erickson: Oh, that's nice. Aren't you involved, you and Betty, in the Botanical Gardens?

Moore: Well, she was very active. She was president for a while. They have a nice plaque up there for her, and she's very much interested in that. She did a lot of committee work. But one of her problems is that she takes things very seriously and very conscientiously, and it takes a lot of time.

Erickson: It sure does.

Moore: So she does very little of that any more, although she does have a group that she takes on trips looking at birds. I think that's about once a month, and she's active in the literature review.

Erickson: Oh, Campus Club.

Moore: Yes, campus groups.

Erickson: Well, how do you feel about the university and the growth pattern that it's in?

Moore: It's inevitable. As I probably implied before, I wish it had different values. I really wish that it were possible for faculty members at the University of California to seriously believe that education is a respectable mission for a university. Now that is unfortunately not so. Promotions and all these other sorts of things, if you are a good teacher, well, that's sort of nice. But the bottom line used to be the number of publications. Now in the sciences so much, it's the outside support you have, the grants you are able to extract.

Erickson: Would you conceptualize the UCR of the future, then from your perspective? What would you like it to be?

Moore: I think it's going to be more of the same things as it gets larger. I think there is some interest and some recognition of the fact that we really do have to do something about education. But the recognition of that and doing something ... I don't know ... the thing that makes me so hesitant is all these committees I am on, you know, they talk about "We have to do something nationwide about education. But somehow the task is so enormous ..."

Erickson: It's huge.

Moore: Of course, the state of education is much more serious today than it was in the '60s when we were working. And this is going to take a lot of effort to change that.

Erickson: But you are willing to keep working?

Moore: Yes.

Erickson: Is there anything else that we didn't cover that you'd like to bring up, John?

Moore: Oh, probably. But I can't think of it now.

Erickson: You can't think of anything. I thank you so much for participating in this interview. It was really interesting.

Moore: Well, thank you. You have to be a flagellant getting these old blowhards and asking them interesting questions. It might be like that little girl who was asked to review a book on penguins. She read it all and said in her review, one sentence: It was more about penguins than I wanted to know.

Erickson: (laughter) No, it was very enlightening. Thank you.

Moore: You are certainly welcome.

END OF INTERVIEW

Text in *italics* has been edited by Professor Moore.